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NEW OR INTERESTING CLAVARIOID FUNGI FROM YUNNAN, CHINA

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Abstract Several new taxa of clavarioid fungi are described from Yunnan Province, fro collections gathered in 1983. Among them are *Aphelaria lacerata*, *Multiclavula sinensis*, *Ramaria hemirubella*, *R. indo-yunnaniana*, *R. sanguinipes* and *R. violaceibrunnea* var. *asiatica*, *Multiclavula fossicola* is reported from China for the first time.

Key words Clavarioid fungi; Taxonomy; Yunnan

In September, 1983, We had an opportunity to collect clavarioid fungi in Yunnan Province. The most significant specimens were gathered in the vicinity of Szemao, about 500 km south of Kunming, and around The Yunnan Institute of Tropical Botany, Xishuangbanna, in extreme southern Yunnan. The specimens of *Aphelaria* and *Multiclavula* were gathered in the field as noted under each of them.

While no field collections of *Ramaria* were found, several taxa were available in the local market of Szemao, and comprised both juvenile and mature fruitbodies, allowing accurate notes, photos, macrochemical reactions and descriptions to be compiled. The forest surrounding Szemao is basically *Pinus-Castanopsis*, the *Pinus szemaoensis* Chen & Lou, *Castanopsis argyrophylla* King ex Hook. f. and *Castanopsis ferox* (Roxb.) Spach are predominant. Because they were for sale in the market, it is assumed that fruitbodies of all the *Ramaria* species reported below are edible.

In the descriptions below, colors in quotation marks are from Ridgway (1912), and TENN is the herbarium of the University of Tennessee. HKAS is the Herbarium of Crgptogams, Kunming Institute of Botany, Academia Sinica.

Aphelaria lacerata Petersen & Zang, sp. nov. Fig. 1

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Basidiocarpi ramosi, tenui, caespitosi, applanati, ad 10×1.5 mm, duri, lacerati, cremei ad pallido-grisei; rami flagelliformi, ad 22 mm longi. Hyphae crassitunicatae, hyalinae, afibulatae ad 1—3-fibulatae; hyphae gloeoplerae communae; basidia 40—50×9—11 μm, clavata, afibulata; sterigmata 4. Sporae 6.1—7.2×5—5.4 μm, subglobosae ad crassi-ovatae, hyalinae, laevae, tenuitunicatae.

Fruitbodies up to 4 × 1 cm, slender, branched, cespitose. Stipe up to 10 ×1.5 mm, arising from an extensive, amorphous mycelial mat, equal, smooth, tough, cartilaginous, off-white. Upper fruitbody flattened, erect, in one plane, less than 1 mm thick, off-white to pallid gray; branching cristate, usually in one rank; apices flagelliform, up to 22 mm long, less than 1 mm thick, flattened, concolorous with main fruitbody below, white at tip. On rotting corn husk base.

Tramal hyphae 4—8 μm diam, hyaline, thin-to slightly thick-walled (wall up to 0.5 μm thick), strictly parallel, tightly packed; septa unclamped (usually) or with 1—3 clamp connections at each septum; clamp connections large, conspicuous. Gloeoplerous hyphae common, 5—7 μm diam, yellow-refringent, otherwise undifferentiated. Hymenium thickening; basidia 40—50× 9—11 μm, clavate to slightly inflated apically, without clamp connections; contents hyaline, homogeneous or with scattered minute granules; sterigmata 4, up to 6 μm long, divergent, sublyriform.

Spores (Fig. 1) 6.1—7.2×5.0—5.4 μm (E=1.20—1.36; Em=1.27; Lm =6.72 μm), subglobose to broadly ovate, hyaline, smooth, thin-walled; contents opalescent; hilar appendix small, papillate.

Commentary: Fruitbodies of *A. lacerata* are rather stereoid in stature, being strongly flattened, pale in color, and with unilateral hymenium. In fact, this organism may have been so placed in the past. With uninflated tramal hyphae, somewhat swollen, large basidia, and appropriate spores, however, it seems best classified as an *Aphelaria*, and as such, seems unreported.

The most striking feature of the fungus is the variability of clamped septa on the tramal hyphae. Although in clamped taxa (e. g. in *Ramaria*) one often sees "cloisons de retret," these are never abundant, and are usually thinner than normal walled septa. In the same way, "secondary septa" are often seen in *Clavaria*, but again they are membranes, not walls. In *A. lacerata*, most (perhaps 60—70 %) septa are unclamped, and appear to be composed of wall material. Of the remaining septa, some are once-clamped as might be expected, but the rest show two (or occasionally three) clamps at the septum. Just as significant, however, is the fact that the basidia are consistently unclamped. In fact, in other genera, basidia are the only reliable structures on which to confirm the presence of clamp connections, for even if the tramal hyphae are clampless or uncommonly clamped, the basidia will exhibit the clamps invariably.

As discussed elsewhere (Petersen, 1986), *Aphelaria* has been split, with one of the segregates, *Tremellodendropsis*, often showing spore germination by repetition. No such phenomenon was observed in this specimen.

Specimen examined: Yunnan Province, Xishuangbanna, The Yunnan Institute of Tropical Botany 17. Ⅸ. 83, coll. Zang Mu & RHP, no. 45641 (Holotype, TENN; isotype HKAS 10469).

Multiclavula fossicola (Corner) Petersen. 1967. Amer. Midl. Nat. 77:208. =*Clavaria fossicola* Corner. 1950. Ann. Bot. Mem. 1:233.

Fruitbodies up to 20 × 2 mm, simple clubs to once or twice branched. Stipe arising from a small white mycelial patch, hoary, white at base, equal, tough in consistency. Club somewhat wider than stipe when simple, commonly branched once, seldom twice, seemingly adventitiously, the branches narrow, with lunate axils, smooth, pinkish beige to ochraceous cream or off-white ("pale pinkish buff," "pale ochraceous salmon," "warm buff"), rubbery in consistency; apex acute when young, becoming narrowly rounded to rounded. Taste and odor negligible. On fine silty soil, with film of algae.

Tramal hyphae 3—9 μm diam, hyaline, thin-to slightly thick-walled (wall up to 0.2 μm thick), without clamp connections, strictly parallel, tightly packed, adherent. Subhymenium extensive, pseudoparenchymatous. Hymenium thickening; basidia 28—35 × 7—8 μm, clavate to subtly urniform at maturity, without clamp connections; contents multiguttulate at maturity, the guttules yellow, refringent; sterigmate 4, up to 7 μm long, straight, apical.

Spores 7—8 × 2.5—3.0 μm, cylindrical to narrowly subreniform, hyaline, smooth, thin-walled; contents 1-several guttulate, the guttules yellow, refringent; hilar appendix small, papillate.

Commentary: The specimens below were collected on the same day, in the same general locale as those of *M. sinensis*, and were thought to be small, faded fruitbodies of the latter. Specimens of both taxa were found on roadbanks disturbed within the preceding 2—3 years and now covred with a thin layer of algae.

The specimens match almost exactly Corner's description of fresh material, and my redescription of the co-type specimen of the species (Petersen, 1967). Corner's (1950) report of spore dimensions was slightly small for the Chinese specimens.

Xishuangbanna is located in the tropical far south of Yunnan Province, and the presence of this species, hitherto known only from Singapore, reflects the tropical climate and fungal flora. Its habitat seems identical in both locations. Neither Singh (1977) not Sharda (1983) reported this species from northern India and adjacent regions.

Specimens examined: Yunnan Province; roadside 3 km south of Xishuangbanna, The Yunnan Institute of Tropical Botany, 17. Ⅸ. 83, no. 45666 (TENN); same location, 10 m from above specimen, 176. Ⅸ. 83, no. 45665 (TENN), 10487, 10492 (HKAS).

Multiclavula sinensis Petersen & Zang, sp. nov.

Basidiocarpi ad 27×2.5 mm, simplici, clavati, phycophili, terrestris; basi albi; clavae aurantiae. Hyphae fibulatae; basidia urniformibus, 25—35×7—9 μm; sterigmata 4. Sporae 6—7 × 3—3.5 μm, cylindricae, tenuitunicatae, albae.

Fruitbodies up to 27×2.5 mm, simple clubs. Stipe arising from a small white mycelial patch, white at base, hoary, tough in consistency, pastel orange ("capucine orange") upward, equal; club somewhat wider than stipe, equal, smooth, rubbery in consistency, pastel orange ("capucine orange"); apex rounded, hemispherical, concolorous with club. Taste very mild of carrots, very tardily musty; odor negligible. On red, silty soil with film of algae.

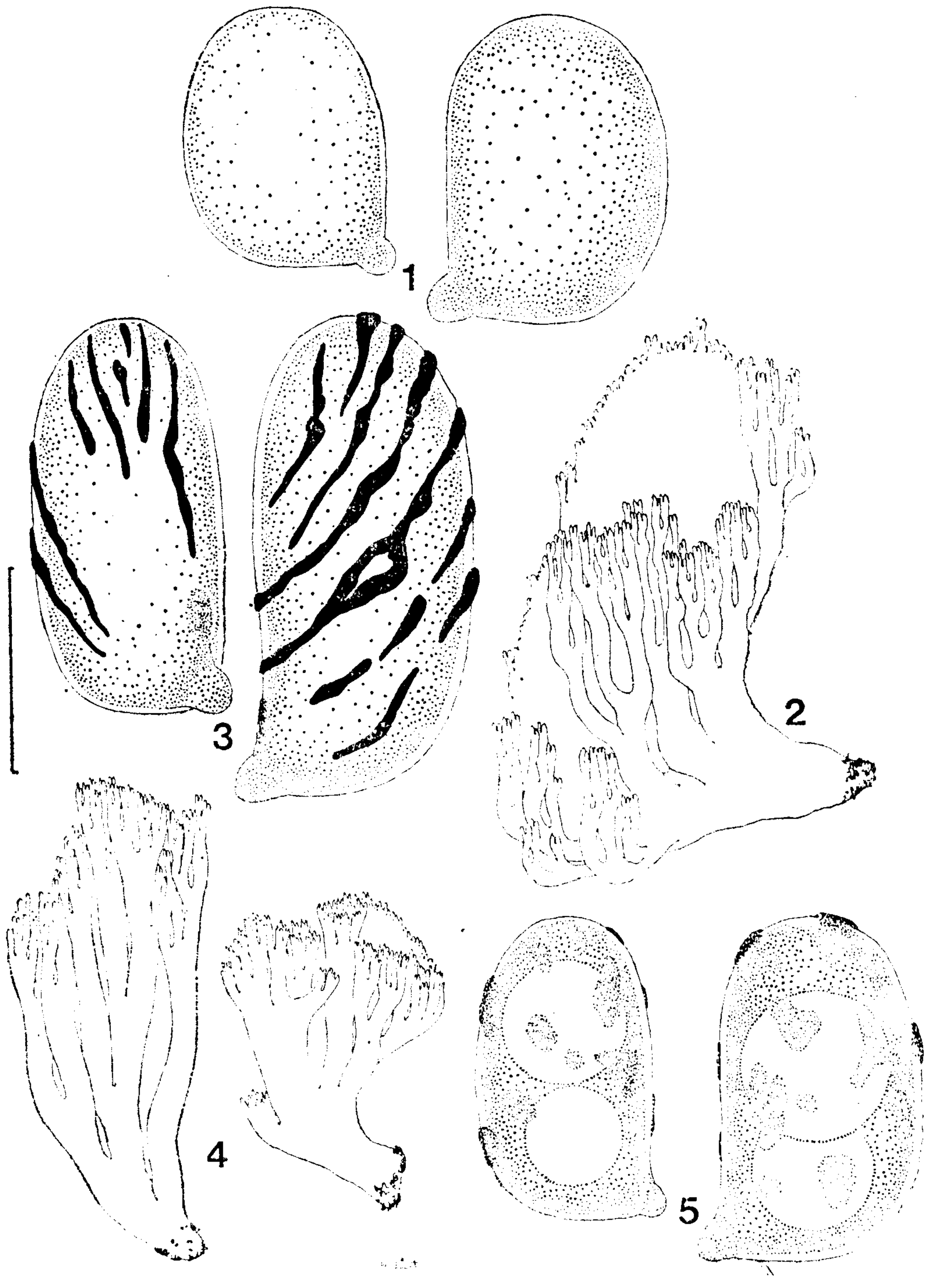
Tramal hyphae 2—11 μm diam, hyaline, thin-walled, clamped, tightly packed, adherent outward, free in center of club, strictly parallel. Subhymenium extensive, pseudoparenchymatous. Hymenium thickening; basidia 25—35× 7—9 μm, broadly ellipsoid when young, hardly urniform at maturity, slightly swollen apically, clamped; contents multiguttulate at maturity, the guttules yellow, refringent; sterigmata 4, up to 7 μm long, straight, apical.

Spores 6—7 × 3—3.5 μm, cylindrical to slightly reniform, smooth, hyaline, thin-walled; contents homogeneous; hilar appendix small, papillate.

Commentary: Two species with orange fruitbodies and similar spores have been described: *Multiclavula clara* (Martin) Pet., and *M. calocera* (Martin) Pet.. Both fruit in South and Central America at relatively high altitudes. With micromorphology extremely constant throughout the genus, only three character fields seem to support discriminatory taxonomy: 1) presence or absence of clamp connections; 2) number of sterigmata per basidium; and 3) spore dimensions. *Multiclavula sinensis* seems unique in three ways: 1) fruitbodies are significantly larger than those of either of the above; 2) fruitbodies are neither clavate nor caloceroid, but clavarioid; and 3) the species, at least for now, seems geographically isolated from either of the other two similar taxa. It is on these bases that we propose it as new.

Specimens examined: Yunnan Province, vic. Xishuangbanna, The Yunnan Institute of Tropical Botany, 17. Ⅸ. 83, coll. D. K. Smith, no. 45639 (Holotype, TENN); Yunnan province, roadside 3 km south of Xishuangbanna, The Yunnan Institute of Tropical Botany, 17. Ⅸ. 83, no. 45644 (TENN,). 10465 (Isotype, HKAS).

Ramaria hemirubella Petersen & Zang, sp. nov. Figs. 2, 3



Figures 1—5. Fruitbodies and spores of clavarioid fungi. 1. Spores of *Aphelaria lacerata* (Holotype). 2, 3. *Ramaria hemirubella* (Holotype). 2. Fruitbody. 3. Spores. 4, 5. *Ramaria indo-yunnaniana* (Holotype). 4. Fruitbodies. 5. Spores. Standard line = 5 μm for spores, Fruitbodies not to scale.

Basidiocarpi multiramosi, ad 13× 8 cm, obovati, odorati; basi ad 5 ×2.5 cm, singuli, subattentuati, albi, amyloidei; rami 2 — 3 , cremei; ramuli cremeo-incarnati; apices ad ramuli concolori, incarnati. Hyphae fibulatae; basidia 45—60× 7 — 9 µm, clavata. Sporae 9.4—11.5×4.3×5.0 µm, striatae.

Fruitbodies (Fig. 2) up to 13× 8 cm, obovate to obpyriform in outline. Stipe up to 5 ×2.5 cm, single, stout, short-carrot shaped, tapering evenly downward, geniculate, off-white, occasionally dicoloring to yellow where handled; flesh soft, dry, punky. Major branches 2 — 3 , thick, curved-ascending, off-white, terete. Branches in 3 — 6 ranks, ascending but not strict, weak (often breaking from their own weight), pinkish ivory, suffusing in time with shades of pinkish buff or rosy tan, especially (and more prominently) downward; axils rounded to lunae; internodes diminishing gradually at maturity. Apices bluntly rounded, divaricate, concolorous with upper branches, pink to pinkish red where rubbed. Taste mild, musty or agaricoid in throat; odor mildly aromatic, typical of the subgenus.

Macrochemical reactions: KOH, NOH=orange; FCL=deep green; IKI= positive on stipe flesh, negative on stipe surface; ANW=ambivalent; GUA, PYR, PHN=negative.

Tramal hyphae of stipe 3 — 9 µm diam, hyalina, thin-walled, hardly parallel, commonly but not invariably clamped, loosely packed, free; ampulliform clamps occasional, thick-walled (wall up to 1 µm thick), ornamented; gloeoplerous hyphae not observed. Tramal hyphae of upper branches similar, parallel, without ampulliform inflations. Hymenium thickening; basidia 45—60× 7 — 9 µm, clavate, clamped; contents granular, strongly cyanophilous; sterigmata (1 — 2) — 4 , straight, apical.

Spores (Fig. 3) 9.4—11.5×4.3—5.0 (E=1.86—2.29; Em=2.02; Lm =9.98 µm), short-cylindrical to narrowly ovate, hardly roughened in profile; contents 1 — 3 -guttulate, the guttules brownish and sludgy; wall up to 0.3 µm thick; hilar appendix abrupt, papillate; ornamentation of weakly cyanophilous striae, oriented in a distal-abaxial to proximal-adaxial configuration.

Commentary: Subgenus *Ramaria* abounds in taxa whose fruitbodies exhibit red or pinkish red coloration. This is manifested inb two ways: 1) naturally pinkish red branch tips (*R. botrytis* (Pers.: Fr.) Ricken, *R. rubripermanens* Marr & Stuntz, *R. rubrievanescens* Marr & Stuntz, etc.), and 2) red-staining or bruising reactions (*R. cacao* (Coker) Corner, *R. holorubella* (Atk.) Corner, etc.). Of these, only *R. cacao* combines the two modes of color manifestation.

In *R. hemirubella,* the reddish blush is hardly a stain and does not “bleed” into the tissues as is the case in *R. holorubella*. Instead, the reddish color suffuses, and is often modified into deep pinkish tan. In fact, the branches appear naturally pinkish ivory and may only tend toward redder coloration in old age.

Fruitbody stature is very similar to that of *R. daucipes* Petersen from eastern North America (Petersen, 1985). In both taxa, the stipe is carrotshaped, tapering evenly and cleanly, and with on abortive branchlets. In *R. daucipes*, however, the stipe stains deep red, does not discolor to yellow upon handling, and spores are considerably longer than those of *R. hemirubella*.

Spores appear typical in ornamentation, albeit somewhat weakly cyanophilous. Dimensions are at the lower limnit of the subgeneric range, however, and hardly approach those of *R. holorubella* or *R. botrytis*. Spore roughness varies considerably when large numbers are viewed.

Sharda (1983) reported *R. rubripermanens* from Bhutan, and his description comes close to that of *R. hemirubella*. *Ramaria rubripermanens* fruitbodies are much more massive and compact than those of either *R. holorubella* or Sharda's description, its coloration much darker red, and its stipe very thick and robust, quite like that of *R. botrytis*. Without examination of the Bhutan material, however, the former author does't wish to pass judgement on whether it is the same as *R. hemirubella*.

In the type specimen, sterigmata are extremely variable in number, shape, size and placement on the basidia. This may be an artifact caused by confinement after collection or by poor drying conditions, or both.

Specimen examined: Yunnan Prov., vic. Simao, 20. Ⅸ. 83, no. 45673 (Holotype, TENN; 10420 Isotype, HKAS).

Ramaria indo-yunnaniana Petersen & Zang, sp. nov. Figs. 4, 5

Basidiocarpi multiramosi, ad 8 × 4 cm, crassi-ovati; basi variabili, solidi, laevi, cremei; rami pallide roseo-incarnati; apices subacuti, coccygini. Odor fabaceus. Hyphae afibulatae; basidia 35—45 × 6—7.5 μm, clavata; sterigmata 4. Sporae 7.2—8.3 × 4.3—5.0 μm, cylindricae, subcorrugatae.

Fruitbodies (Fig. 4) up to 8 × 4 cm, broadly obovate in outline. Stipe single, discrete, short to long, solid without aborted branchlets, smooth, not glabrous or canesecent, ivory-colored ("pale ochraceous salmon," "light buff"); flesh off-white, very slightly soapy when sliced and rubbed. Major branches few, ascending but not strict, pallid rosy pink ("grenadine pink") when adolescent, probably brighter when juvenile; small soil particles causing weak vinescent spots; axils rounded; apices more or less acute, probably terraced when young, rich muted rosy magenta ("rose doree," "begonia rose") when adolescent, perhaps somewhat brighter when juvenile and probably fading to pallid ochraceous in age. Taste negligible; odor weakly fabaceous; apparently edible.

Macrochemical reactions: KOH = orange on hymenium; FCL = strongly positive; PHN = equivocal; GUA, NOH, ANW, PYR, IKI = negative.

Tramal hyphae of stipe flesh up to 10 μm diam, probably adherent, hyaline, clampless, otherwise not supporting microscopic analysis. Tramal hyphae of upper branches hyaline, up to 8 μm diam, thin-walled, clampless, adherent, tightly packed, strictly parallel. Hymenium thickening; basidia 35—45 × 6—7.5 μm, clavate, clampless; contents granular, uniformly cyanophilous apically (without discernable cyanophilous granules); sterigmata 4, straight, spindly. Leptocystidial hyphal tips common in hymenium, especially in young hymenium, up to 4 μm diam; contents cyanophilous.

Spores (Fig. 5) 7.2—8.3 × 4.3—5.0 μm ($E = 1.54—1.83$; $Em = 1.71$; $Lm = 7.75$ μm), cylindrical to slightly convex abaxially, obviously rough in profile; contents uni-several guttulate, the guttules sludgy, refringent; wall up to 0.3 μm thick; hilar appendix eccentric, rarely discrete; ornamentation of obscure, hardly cyanophilous patches up to 0.2 μm high.

Commentary: This is what Sharda (1983) called *Ramaria araiospora* var. *rubella* Marr and Stuntz. Fruitbodies of the latter are distinctly magenta, not merely bright pinkish red, and produce spores somewhat larger ($Lm = 9.8$ μm). Moreover, fruitbodies of *R. araiospora* and *R. cyaneigranosa* Marr and Stuntz are typically larger than those reported here and by Sharda Instead, the Asian taxon seem most similar to *R. rosella* Petersen from the southern Appalachian Mountans of eastern North America (Petersen, 1985). *Ramaria rosella* shares almost identical coloration and stature, but produces somewhat larger spores.

The sole specimen we have examined were gathered in the market in Szemao, accounting for the presumption of edibility. While a forest fungus, no information is available on the tree association under which it fruits. Sharda (1983) reported his collections from under deciduous trees (unlike *R. araiospora*, which has been reported by Marr and Stuntz from under conifers). The range of geographic distribution of *R. indo-yunnaniana* would appear to comprise at least western China and the eastern Himalayas.

Sharda compared this taxon with *R. subbotrytis* (Coker) Corner, and rightly concluded them to be separate. The latter produces much stouter, larger fruitbodies with basically pink to rosy pink branches and apices, and larger spores.

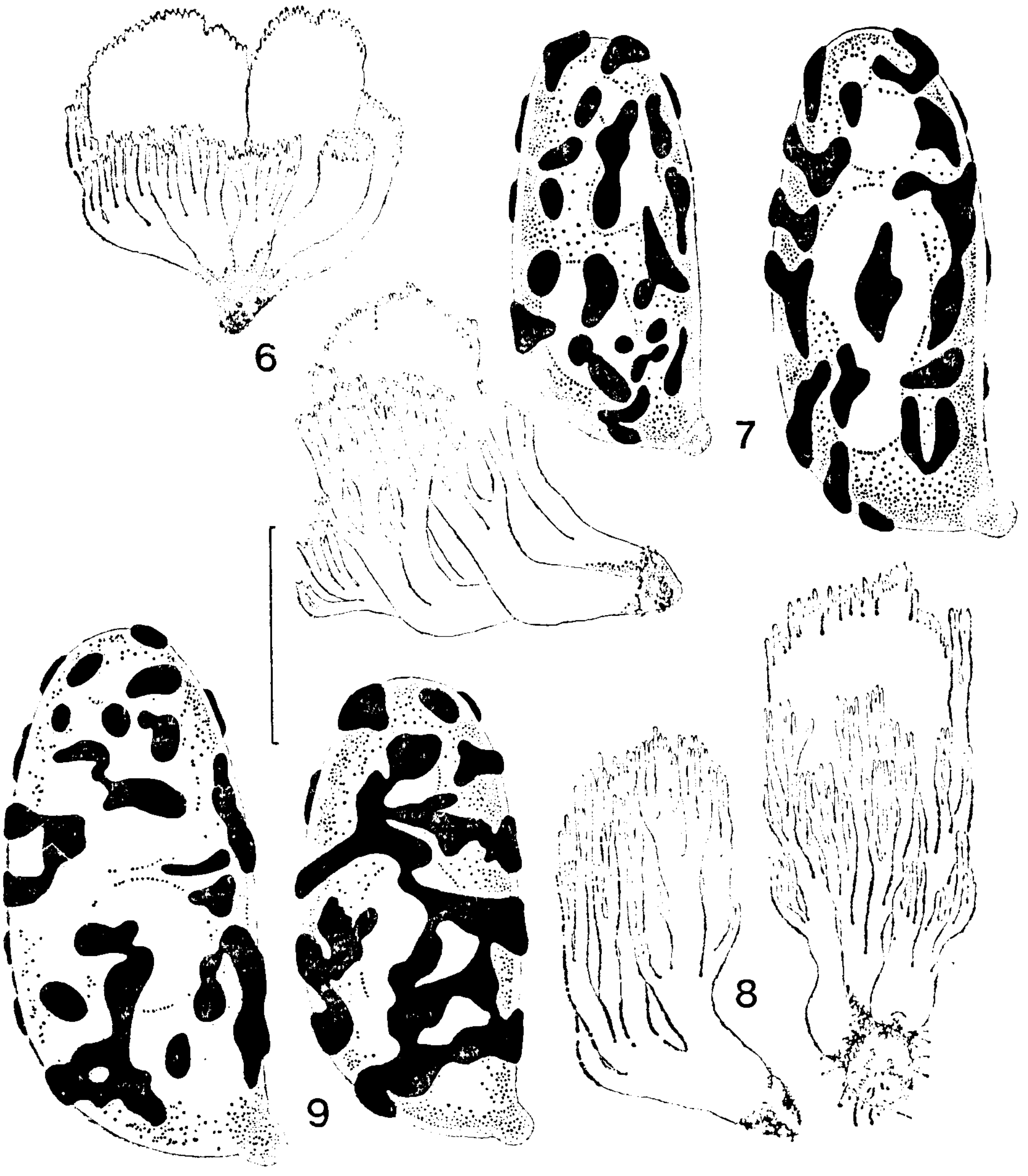
From its original description, *R. subbotrytis* var *intermedia* (under

Clavaria; Coker, 1923) could be taken as similar to *R. indo-yunnaniana*. In reality, while its coloration is similar, its hyphae are clamped and its spores significantly larger than those of the Asian taxon.

Specimen examined: Yunnan, Szemao, 20. Ⅸ. 83, no. 45681 (Holotype, TENN; 10422. isotype, HKAS).

Ramaria sanguinipes Petersen & Zang, sp. nov. Figs. 6, 7

Basidiocarpi multiramosi, ad 6 × 5 cm, plus minus globosi. Basi solidi, singulati, ad 30×30 mm, albi, rubidi colorati; rami cremei; ramuli pallido-flavi; apices flavi; odor exiliter fabaceus. Hyphae afibulatae; basidia fibulatae, 40—45× 8—10 μm; sterigmata 4. Sporae 9.4—11.5×4.3—5.0 μm, ellipsoidae, corrugatae.



Figures. 6—9. Spores and fruitbodies of *Ramaria* species (Holotypes). 6, 7. *R. sanguinipes*. 6. Fruitbodies. 7. Spores. 8, 9. *R. violaceibrunnea* var. *asiatica*. 8. Fruitbodies. 9. Spores. Standard line = 5 μm for spores. Fruitbodies not to scale.

Fruitbodies (Fig. 6) up to 6 × 5 cm, curved obovate to generally circular in outline, repeatedly branched. Stipe single, and then stout (up to 30 × 30 mm) or fasciculate, and then stout (up to 30 × 14 mm), smooth to somewhat marbled, off-white to ivory-colored, not canescent, without aborted branchlets, rounded at base, tapering sharply downward, stained maroon ("madder red") at base, and suffused in this color upward; flesh solid, dry, punky, marbled, deep pinkish red downward under stained surface. Major branches several, short when young, lengthening significantly over time, ivory-colored; branches in 3—6 ranks, abruptly shorter than major branches, ivory-colored below, pallid clear yellow ("baryta yellow") upward, eventually fading to pallid ocher; axils narrowly rounded; internodes diminishing abruptly above in adolescence, less so at maturity; apices slender, small, not terraced at any age, somewhat divaricate in some specimens, dichotomous, pallid clear yellow ("baryta yellow"). Taste mildly fabaceous; odor weakly aromatic.

Macrochemical reactions: KOH=orange; FCL=green; GUA, NOH, PHN, ANW, PYR, IKI=negative.

Tramal hyphae of stipe up to 14 μm diam, hyaline, thin-walled to locally somewhat thick-walled (wall up to 0.5 μm thick), virtually unclamped, not parallel. Tramal hyphae of upper branches up to 10 μm diam, hyaline, thin-walled, parallel; clamp connections occasional on medullary hyphae, common on cortical hyphae. Subhymenium extensive, hyphal. Hymenium thickening; basidia 40—45 × 8—10 μm, clavate, clamped invariably; contents granular to multiguttulate; sterigmata 4, more or less straight, somewhat divergent.

Spores (Fig. 7) 9.4—11.5 × 4.3—5.0 μm ($E=2.00$—2.58; $Em=2.28$; $Lm=10.47$ μm), ellipsoid to narrowly ovate, often with suprahilar depression, conspicuously rough in profile; content 1-several guttulate, the guttules deep ocher to brown; wall up to 0.3 μm thick; hilar appendix small but conspicuous; ornamentation of cyanophilous, complex, anastomosing ridges and a few isolated warts up to 0.3 μm high.

Commentary: As have previous workers, we perceive complexes of taxa whose fruitbodies are similar, and envision these under a category called "consociation." Unlike a stirps (in the sense of Smith, i. e. 1979), which represents what a mycologist views as a "natural" cluster of taxa, my concept comprises taxa which may be related or not so, but which have conspicuous characters fields in common. Thus, the *Ramaria sanguinea* consociation includes the "type species," *R. sanguinea* (Pers.) Quel., as well as *R. xanthosperma* (Peck) Corner and *R. rubiginosa* Marr and Stuntz, all clampless, and *R. eosanguinea* Petersen, which is clamped, as well as some undescribed taxa, *Ramaria sanguinipes* obviously fits in this consociation, sharing the maroon-staining base, pale branches and yellow apices.

Singh (1977), under *R. eosanguinea*, redescribed a collection by Thind and Dev (1957) from the Mussoorie Hills of India, in which the stipe tramal hyphae were clampless but the basidia were clamped. The authors are inclined to think that that collection is contaxic with *R. sanguinipes*, for all microscopic characters, and almost all macroscopic characters match. Thind and Dev reported of their fruitbodies "… yellow, later turning light dark red at the top, on drying reddish brown to dark brown …" "…flesh white, on bruising slowly turning red to dark red …" Sometimes fruitbodies of the "*R. sanguinea* consociation" tend to blush red upwards in age, especially if kept in a confined place after picking, not unlike some members of the striate-spored complex (i. e. *R. holorubella*), which may account for their report.

At any rate, the Yunnan specimen does not represent any taxon in the consociation to our knowledge, and it is here proposed as new. The type specimen was acquired in the market in Szemao, and so must be presumed edible. It was reported to have been collected under *Pinus szemaoensis* Chen and Lau. and *Castanopsis argyrophylla* King ex Hook. f.

Specimen examined: Yunnan, Szemao, 20. Ⅸ. 83, no. 45677 (Holotype, TENN; 10418 Isotype, HKAS).

Ramaria violaceibrunnea var. asiatica Petersen & Zang. var. nov. Figs. 8, 9

Ut varietate typica, sed sporae 10.4—12.2 × 5—5.8 μm, subcorrugatae ad subverruculosae.

Fruitbodies (Fig. 8) up to 11 × 4.5 cm, repeatedly branched, obovate in profile. Stipe single to falsely fascicullate, fleshy, solid, rounded at base, more or less equal, up to 30 × 20 mm, white where protected, gradually pallid dull violaceous ("vinaceous drab") upward, with common areas of brown or tan ("cameo brown"); flesh white, dry, drying punky. Major branches 3—4, thick, fleshy, ascending; branches in 3—5 ranks, terete, often obscurely rugulose, flesh tan in color ("tawny olive," "sayal brown"); internodes diminishing gradually; axils rounded; apices slender, double-dichotomous, somewhat prolonged, concolorous with branches; branches bruising slowly brown. Taste negligible; odor weakly fragrant, aromatic.

Macrochemical reactions: NOH, KOH = dark orange; FCL = deep green; ANW = positive; GUA, PYR, PHN, IKI = negative.

Tramal hyphae of upper branches 3.5—8 μm diam, hyaline, clamped, hardly inflated, thin-walled, parallel, tightly packed; ampulliform swellings as clamps, up to 12 μm broad, not abrupt, somewhat thick-walled (wall up to 1.5 µm thick), unornamented. Subhymenium extensive, hyphal. Hymenium thickening; basidia 50—58 × 7—8 µm, clavate, clamped, hyaline; contents scattered-multiguttulate; sterigmata 4, spindly, straight.

Spores (Fig. 9) 10.4—12.2 × 5—5.8 µm (E=2.00—2.42; E_m=2.15; Lm =11.34 µm), ellipsoid, often with suprahilar depression, roughened in profile, yellowish; contents uni-to biguttulate, the guttules dark and refringent; wall up to 0.5 µm thick; hilar appendix broad, with no throat; ornamentation of complex meandering and anastomosing ridges and wart up to 0.3 µm high.

Commentary: There is a small complex of taxa in which violet coloration predominates. Traditionally, *R. fennica* (Karst.) Quel., with avellaneous stipe apex but mustard yellow branches when mature, has been thought of as separate from *R. fumigata* (Peck) Corner. The latter has been thought to show avellaneous stipe *and* branches, with the branches slowly alutaceous from spore pigmentation. In reality, examination of the type specimen of *R. fumigata* shows that name to be synonymous with *R. fennica.* Thus the taxon which has been known as *R. fumigata* requires a new name. Parenthetically, Schild's (1971) illustration of "*R. fumigata*" is the best yet offered.

Singh (1977) ftrst reported a similar organism from the eastern Himalayas (vic. Dalhousie) and Sharda (1983) provided another description and several illustrations, all under the name *R. fumigata.* Not only was the fungus found under mixed angiosperm-gymnosperm forests, but was sold in the local markets. Sharda drew attention to the dramatic color change of the hymenium to "venetian red" in 20 % KOH and to "maize yellow" in 10% H_2SO_4 (these colors are without notation on source, so must be assumed to be Sharda's).

In Szemao, Yunnan Province, the same organism can be found in the market. Superficially, it ts quite similar to "*R. fumigata* ss. auct.", varying only in somewhat larger, more attenuate fruitbodies. Microscopically, tramal hyphae and basidia are quite similar, and spore dimensions match closely. Only spore ornamentation differs somewhat. In *R. fennica* (=*R. fumigata*), ornamentation is quite coarse, but comprises mostly isolated warts together with some meandering ridges. Spores of the Chinese collections shows ornamentation composed almosty exclusively of complex, anastomosing ridges and only a few isolated warts.

Other names which represent taxa seemingly in this complex include *Clavariella cedretorum* Maire, *R. rufo-violacea* (Barla) Quél., and *R. fennica* var. *violaceibrunnea* Marr and Stuntz. The latter was described as showing more delicate spore ornamentation than *R. fennica/fumigata. Ramaria rufoviolacea* seems closer to *R. bataillei* (Maire) Corner, described more accurately previously (Petersen, 1979). *Clavariella cedretorum* was discussed by Corner (1950) under *R. fumigata*, but from Maire's illustrations and description, it would seem much more brilliantly purple than the other taxa above.

The type specimen of *R. fennica* var. *violaceibrunnea* was collected by Marr and Petersen together, and Petersen has several additional collections of the taxon from western North America. We believe that the variety in not conspecific with the type variety (*fennica*), and can serve as the first valid name for the taxon which most authors have treated as *R. fumigata*. We propose the following: *Ramaria violaceibrunnea* (Marr and Stuntz) Petersen, stat. nov. (Basionym: *Ramaria fennica* var. *violaceibrunnea* Marr and Stuntz. 1973. Biblioth. Mycol. 38:78).

With the species epithet in place, the Asian taxon can be placed under it as a separate variety based on differences in spore ornamentation. It is likely that the eastern North American and European counterparts will also be segregated in time, based on fruitbody size and spore ornamentation.

Specimen examined: Yunnan, Szemao, 20. Ⅸ. 83, no. 45674 (Holotype, TENN; 10424 isotype, HKAS).

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妙趣横生的滇产珊瑚菌类及其新种

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摘要　一九八三年九月，作者对西双版纳勐仑附近进行了为期五天的真菌调查采集。路过思茅时，偶在市场上购得数枚食用真菌，经研究后，其中珊瑚菌类不少与印度、南亚、中南美洲等热带高山地区的种类相比，既有系统上的联系，又有个体上的不同；既有热带成分的共性，又有本地区物种的特性。本文对该地区珊瑚菌类确立了如下六个新分类单位：裂枝滑瑚菌*Aphelaria lacerata* Petersen et Zang，中华地衣棒瑚菌*Multiclavula sinensis* Petersen et Zang，淡红丛枝瑚菌*Ramaria hemirubella* Petersen et Zang，印滇丛枝瑚菌*Ramaria indo-yunnaniana* Petersen et Zang，红柄丛枝瑚菌*Ramaria sanguinipes* Petersen et Zang，紫褐丛枝瑚菌亚洲变种*Ramaria violaceibrunnea* var. *asiatica* Petersen et Zang.文中并讨论了中国新记录的湿生地衣棒瑚菌*Multiclavula fossicolal* (Corner) Petersen. 文中所用缩写其意思如下：E = 孢子长度大于阔度的倍数；L_m = 孢子长度平均值；E_m = 孢子阔度平均值。

关键词　珊瑚菌类；分类；云南